What is claimed is:

1. A cryoplasty catheter, comprising:

a shaft having proximal and distal ends, the shaft defining an inflation lumen, coolant intake lumen and exhaust lumen therethrough, each lumen having a proximal and distal end proximate the proximal and distal ends of the shaft respectively;

a dilatation balloon disposed at the distal end of the shaft and in fluid communication with the inflation lumen; and

a chamber disposed within the balloon and in fluid communication with the intake and exhaust lumens.

2. The cryoplasty catheter in accordance with claim 1, wherein the source of coolant connected to the proximal end of the shaft in fluid communication with the intake lumen.

3. The cryoplasty catheter in accordance with claim 2, wherein the coolant source contains liquid N_2.

4. The cryoplasty catheter in accordance with claim 1, further comprising a thermo-resistive sensor disposed on the dilatation balloon.

5. The cryoplasty catheter in accordance with 4, further comprising a second thermo-resistive sensor disposed on the shaft.

6. The cryoplasty catheter in accordance with claim 1, wherein the shaft further defines a guidewire lumen.

7. The cryoplasty catheter in accordance with claim 1, wherein the shaft is at least in part surrounded by an insulating sheath which in part defines a vacuum lumen.

8. A cryoplasty catheter, comprising:

a shaft having proximal and distal ends, the shaft defining an inflation lumen and a drain lumen therethrough, each lumen having a proximal and distal end proximate the proximal and distal ends of the shaft respectively; and

a dilatation balloon disposed at the distal end of the shaft and in fluid communication with the inflation and drain lumens.

9. The cryoplasty catheter in accordance with claim 8, further comprising a coolant source connected to the proximal end of the shaft and being in fluid communication with the inflation lumen.

10. The cryoplasty catheter in accordance with claim 9, wherein the coolant source contains a liquid N_2.

11. The cryoplasty catheter in accordance with claim 9, wherein the coolant source contains a super cooled liquid.

12. The cryoplasty catheter in accordance with claim 8, further comprising a thermo-resistive sensor disposed on the dilatation balloon.

13. The cryoplasty catheter in accordance with 12, further comprising a second thermo-resistive sensor disposed on the shaft.

14. The cryoplasty catheter in accordance with claim 8, wherein the shaft further defines a guidewire lumen.

15. The cryoplasty catheter in accordance with claim 8, wherein the shaft is at least in part surrounded by an insulating sheath which in part defines a vacuum lumen.

16. A method of performing cryoplasty, comprising the steps of:

advancing across a lesion a dilatation balloon catheter including a shaft having a proximal end and distal end, the shaft defining a coolant intake lumen, the catheter having a dilatation balloon disposed at its distal end wherein at least a portion of the internal balloon volume is in fluid communication with the coolant inlet lumen;

inflating the balloon to dilate the lesion; and

delivering coolant to the balloon to cool the lesion to aid in mechanical remodeling of the lesion by dilatation.

17. The cryoplasty method in accordance with claim 16, wherein the lesion adjacent the balloon is cooled to between 20°C and 0°C for aiding in remodeling of the lesion.

18. The cryoplasty method in accordance with claim 16, further comprising the step of freezing a portion of the lesion adjacent to the balloon to kill cells within the lesion.

19. A cryoplasty method in accordance with claim 18, wherein the freezing is by flash freezing for 20 to 60 seconds to enhance the effectiveness of the freezing step.

20. The cryoplasty method in accordance with claim 18, wherein the cells are frozen at a temperature of between 0°C to -40°C.

21. A cryoplasty method in accordance with claim 16, wherein the dilatation catheter further includes an inflation lumen, exhaust lumen and a separate coolant chamber within the balloon to contain coolant separately from balloon inflation fluid, the chamber in fluid communication with the intake lumen and exhaust lumen.

22. A method of performing cryoplasty, comprising the steps of:

advancing across a l sion a dilatation balloon catheter including a shaft having a proximal end and distal end, the shaft defining a coolant intake lumen, the catheter having a dilatation balloon disposed at its distal end wherein at least a portion of the internal balloon volume is in fluid communication with the coolant inlet lumen;

inflating the balloon to dilate the lesion; and

delivering coolant to the balloon to freeze a portion of the lesion adjacent to the balloon to kill cells within the lesion.

23. The cryoplasty method in accordance with claim 22, wherein the freezing is by flash freezing for 20 to 60 seconds to enhance the effectiveness of the freezing step.

24. The cryoplasty method in accordance with claim 22, wherein the cells are frozen at a temperature of between -20°C to -40°C.

25. The cryoplasty method in accordance with claim 22, wherein the dilatation catheter further includes an inflation lumen, exhaust lumen and a separate coolant chamber within the balloon to contain coolant separately from balloon inflation fluid, the chamber in fluid communication with the intake lumen and exhaust lumen.

26. A cryoplasty method in accordance with claim 22, further comprising the step of:

delivering coolant to the balloon to cool the lesion to aid in mechanical remodeling of the lesion by dilatation.

27. The cryoplasty method in accordance with claim 26, wherein the lesion adjacent the balloon is cooled to between 10°C and to -10°C for aiding in remodeling of the lesion.